

# *epi*TRENDS

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on Epidemiology  
& Public Health  
Practice in  
Washington State

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## Foodborne Illness: Prevention and New Technology Together Combat Emerging and Changing Organisms

Foodborne illness continues to be a significant cause of morbidity and mortality in the United States, even though our food supply is among the safest in the world. Gastrointestinal illnesses can often be traced to contaminated food. While emerging pathogens have created new challenges, advances in epidemiology and laboratory techniques allow identification of outbreaks as they occur and prevent even greater spread of potentially deadly diseases.

Since 1993 Washington has averaged more than 130 reported outbreaks (two or more related cases) of foodborne illness per year. Common confirmed or suspected pathogens include *Salmonella*, *Clostridium perfringens*, and gastroenteropathic viruses. Recent studies by the Centers for Disease Control and Prevention (CDC) found that diarrheal cases are often caused by *Campylobacter jejuni*, a common foodborne pathogen. The true number of cases and outbreaks of foodborne illness is unknown.

We do know that new pathogens are emerging and well-known pathogens are causing illnesses via foods not previously implicated. Just in the last few years, *E. coli* O157:H7 has caused thousands of illnesses and several deaths in outbreaks linked to undercooked hamburger, unpasteurized apple juice, and a wide variety of fresh produce. In Washington State, an antibiotic-resistant strain of *Salmonella typhimurium* has caused dozens of illnesses through the consumption of unpasteurized soft cheese.

And, just this spring, a nationwide recall of an oat cereal occurred after it was linked to a *Salmonella Agona* outbreak. This episode is a classic example of the new challenges facing food safety experts. Some pathogens can survive for weeks in dry or acidic environments, and low doses can sometimes lead to illness. The international market helps send these pathogens over longer distances and to more people.

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## 1998 Hantavirus Update: One New Case in Washington

The fifteenth reported case of hantavirus pulmonary syndrome (HPS) in Washington, and the first in 1998, occurred in May in Franklin County. HPS, a severe and potentially fatal viral respiratory disease carried by deer mice, was first described in the Southwest in 1993.

Deer mice shed the virus into the environment in their feces, urine, and saliva. Transmission to humans likely occurs through inhalation of airborne virus particles or direct contact with the rodents, their excretions, or their nesting materials. Deer mice are found throughout Washington, more commonly in rural areas. They have white bellies and furry tails, which are dark on top and white on the entire underside. Of 625 deer mice captured throughout Washington since 1993, about 10% have been hantavirus positive.

Recent HPS case reports include two in 1994, four each in 1995 and 1996, and three in 1997. A 1985 case was confirmed retrospectively in 1994. Eleven of the 15 cases occurred on the east side of the Cascade Mountains and seven of the 15 have been fatal. Through June 22, 1998, 185 HPS cases have reported in the United States with 81 fatalities (43.8%).

HPS begins one to six weeks after rodent exposure, although not all patients give a history of exposure. Patients experience a prodromal phase lasting one to seven days with fever, chills, and body aches that sometimes include severe back and leg pains. Nausea, vomiting, diarrhea, and abdominal pain also may occur. There is no

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## Foodborne Illness *(from page 1)*

### What is being done?

The food service industry, cooperative extension offices, schools, and local and state health departments are working hard to disseminate information about the most important ways to prevent foodborne illness — handwashing, controlling cross-contamination, thorough washing and cooking of raw products, and avoiding room temperature storage of potentially hazardous foods. These messages are especially important for high-risk persons (e.g., very young, elderly, or immunocompromised), who make up an increasing percentage of our population.

President Clinton has proposed two food safety initiatives to Congress. This concern at the highest levels of government is being translated into much needed assistance to federal and state health agencies.

New laboratory techniques and computer technology have confirmed outbreaks more quickly, with the promise of preventing more cases and saving lives. For example, a Department of Health epidemiologist recently developed a one-day test to “fingerprint” cultures of *E. coli* O157:H7. This new test, and the ability to download the fingerprint results to a national database, will allow experts to quickly identify national or regional outbreaks and take appropriate control measures (e.g., recalling a food product).

Another innovation is FoodNet, a cooperative program involving the CDC and

seven states that are attempting to improve reporting from labs and health care providers to accurately determine the real burden of foodborne disease. Enhanced epidemiological follow-up on all reported cases has led to better knowledge about the prevalence of specific organisms and risk factors.

Everyone has a role in preventing foodborne illness and helping to control outbreaks. Everyone can practice safe food preparation and handling and encourage others to do so. Persons who become ill should report the illness to the local health department or see their physician for diagnosis and care. Physicians can request appropriate samples. And federal, state, and local health officials have a responsibility to investigate promptly and implement adequate control measures.

The one important link in this process, and a weak one in the past, is the routine culturing of specimens from persons with gastrointestinal illnesses. However, as physicians have become more familiar with foodborne illnesses and the importance of early detection, they are being more proactive in requesting stool samples and tests for common foodborne pathogens.

In coming years, we will likely encounter new foodborne pathogens and related challenges. It is critical for health care professionals to stay abreast of developments and outbreaks. The mass media and the Internet can be helpful sources of information. See the side column for Department of Health information numbers. ♦

### For More Information

If you have questions, please contact the Washington State Department of Health Epidemiology Section at (206) 361-2914 or Community Environmental Health Programs at (360) 236-3063.

See WWW Access Tips on page 4.

### For More Information on Hantavirus ▼

Contact the Centers for Disease Control and Prevention (CDC):  
CDC hantavirus voice information: 1-877-232-3322  
CDC fax retrieval service: 1-888-233-3228  
Website: <http://www.cdc.gov/ncidid/diseases/hanta/hps/index.htm>

The Washington State Department of Health posts information on its Website: <http://www.doh.wa.gov>

**TABLE 1: Some common laboratory and clinical findings in hantavirus pulmonary syndrome (HPS)**

#### *Prodromal Phase*

Low platelet count (<150,000 in 98% of cases, <130,000 in 92%)  
Elevated lactic dehydrogenase (LDH)  
Elevated aspartate aminotransferase (AST)  
Decreased serum bicarbonate

#### *Progressed Disease*

Thrombocytopenia	Acidosis
Elevated hematocrit	Reduced serum albumin
Elevated LDH and hepatic enzymes	
Leukocytosis with circulating myelocytes, promyelocytes, and immunoblasts (recognized as atypical lymphs)	
Abnormal partial thromboplastin time (PTT)	
Chest X-ray showing bilateral interstitial infiltrates.	

## Hantavirus *(from page 2)*

specific laboratory result for prodromal HPS. A low platelet count is the only CBC abnormality consistently seen (Table 1).

Cough and shortness of breath occur four to 12 hours before onset of respiratory failure. Hypotension is due to cardiogenic shock with low cardiac output and normal or elevated peripheral vascular resistance. Aggressive critical care management is appropriate, including inotropic agents and mechanical ventilation.

Monitoring of rodent populations in the southwestern United States has documented an increase in deer mice. Washington does not monitor rodents statewide but similar increases may have occurred in some areas. If so, the likelihood of human-rodent interactions and hantavirus exposure increases.

# Monthly Surveillance Data by County

June 1998\* – Washington State Department of Health

County	E. coli O157:H7	Salmonella	Shigella	Hepatitis A	Hepatitis B	Non-A, Non-B Hepatitis	Meningococcal Disease	Pertussis	Tuberculosis	Chlamydia	Gonorrhea	AIDS	Pesticides†	Lead\$#
Adams	0	0	0	0	0	0	0	0	0	4	0	0	1	1/#
Asotin	0	1	0	0	0	0	0	0	0	4	0	0	0	0/0
Benton	0	2	0	0	0	0	0	0	1	13	0	1	2	0/29
Chelan	0	0	1	1	0	0	0	1	1	7	0	0	7	3/9
Clallam	1	0	0	0	1	0	0	0	1	1	0	1	0	0/0
Clark	0	2	1	0	2	0	3	0	0	32	5	2	2	0/0
Columbia	0	0	0	0	0	0	0	0	0	1	0	0	0	0/0
Cowlitz	0	0	0	0	0	0	0	0	2	7	0	0	1	2/24
Douglas	0	1	0	0	0	0	0	0	0	0	0	0	1	0/0
Ferry	0	0	0	0	0	0	0	0	0	2	0	0	0	0/0
Franklin	0	0	0	0	0	0	0	0	0	9	0	1	2	0/0
Garfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Grant	0	1	1	0	0	0	0	0	0	2	0	0	3	0/#
Grays Harbor	0	2	0	0	0	0	0	2	0	15	0	1	0	0/0
Island	0	0	0	0	0	0	0	0	0	10	2	0	0	0/7
Jefferson	0	0	0	1	0	0	0	0	0	3	0	0	1	0/0
King	0	8	2	133	8	0	3	3	9	289	70	9	4	0/33
Kitsap	0	0	0	0	0	0	0	0	0	46	10	0	2	0/8
Kittitas	0	0	0	1	0	0	0	0	0	1	0	1	1	0/0
Klickitat	0	1	0	0	0	0	0	0	0	5	0	0	0	0/0
Lewis	0	0	0	0	0	0	0	0	0	8	0	0	0	0/#
Lincoln	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Mason	0	0	0	0	0	0	0	0	1	4	0	0	0	0/#
Okanogan	0	2	0	1	0	0	0	0	0	2	1	0	6	0/#
Pacific	0	0	0	2	0	0	0	0	0	0	0	0	0	0/0
Pend Oreille	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Pierce	0	6	0	4	0	0	0	6	0	126	32	2	0	1/82
San Juan	0	0	0	0	0	0	0	0	0	1	0	0	0	0/0
Skagit	1	2	1	0	0	0	0	0	0	14	1	0	0	0/#
Skamania	0	0	0	0	0	0	0	0	0	1	0	0	0	0/0
Snohomish	1	13	2	3	2	0	0	2	4	64	12	4	4	0/#
Spokane	2	3	0	32	1	0	1	0	1	31	5	1	5	0/#
Stevens	0	0	0	0	0	0	0	0	0	1	0	0	0	0/0
Thurston	0	5	0	0	0	0	1	0	0	25	3	0	0	0/5
Wahkiakum	0	0	0	0	0	0	0	0	0	0	0	0	0	0/0
Walla Walla	0	1	0	1	0	0	0	0	1	12	0	0	2	1/8
Whatcom	0	0	0	1	0	0	1	0	0	1	0	5	0	0/#
Whitman	0	0	0	0	0	0	0	0	0	0	0	0	2	0/0
Yakima	0	0	1	0	0	0	1	2	2	34	3	1	19	2/14
Unknown														1/1

Current Month	5	50	9	181	14	0	10	16	23	775	144	29	65	11/238
June 1997	6	44	12	60	9	3	3	23	26	788	155	47	62	11/297
1998 to date	25	177	56	568	52	10	41	139	122	5284	900	214	191	70/1810
1997 to date	23	279	100	280	39	14	52	182	146	4602	965	338	159	67/2039

\* Data are provisional based on reports received as of June 30, unless otherwise noted.

† Unconfirmed reports of illness associated with pesticide exposure.

\$# Number of elevated tests (data include unconfirmed reports) / total tests performed (not number of children tested); number of tests per county indicates county of health care provider, not county of residence for children tested; # means fewer than 5 tests performed, number omitted for confidentiality reasons.



## WWW Access Tips

For information on food safety, consult the U.S. Food and Drug Administration Center for Food Safety and Applied Nutrition at: <http://vm.cfsan.fda.gov/list.html> or through <http://www.fda.gov>. This site has a link to the FDA's "Bad Bug Book," also known as the *Foodborne Pathogenic Microorganisms and Natural Toxins Handbook*. The address is: <http://vm.cfsan.fda.gov/~mow/intro.html>

## A Back to School Vaccination Update

Washington State is vitally interested in ensuring that all children from birth to 19 years of age are adequately immunized. The year 2000 goal is 90% coverage for preschool children. Data from the National Immunization Survey (July 1996 to June 1997) of the Centers for Disease Control and Prevention show that 82% of children aged 19–35 months are receiving vaccines on schedule. The percentage goes up to 96% at school entry. However, students in grades 1–12 may not receive all the recommended (though not required) vaccines.

Current requirements for school and child care attendance are based on the 1995 recommended schedule from the Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics (AAP), and the Academy of Family Practitioners (AFP). Immunizing children according to the more recent 1998 ACIP/AAP schedule is not in conflict with the 1995 minimum requirements.

Completion of the hepatitis B series for kindergarten and first grade is required for the 1998–1999 school year. A second measles/mumps/rubella (MMR) immunization is still required at entry to sixth grade and for transfer students in grades 7–12. Other vaccines recommended for adolescents are:

- Varicella for students who have no history of the disease;
- Hepatitis B series should be initiated if not previously given;
- Tetanus/diphtheria booster if it has been longer than five years since the last tetanus immunization.
- Second MMR for any adolescent above sixth grade if not previously given.

Health care providers are encouraged to review the immunization records of each patient at every visit and immunize appropriately. For more information, call your local health department or the state immunization program at 360-236-3595.

### Clarification to TB Article in the June Issue

Last month's report on tuberculosis (*epiTRENDS* 1998; 3(6):1–2) suggested that all "foreign-born persons with latent TB infection should be considered candidates for preventive isoniazid therapy, regardless of age." This statement merits clarification. Infected persons 35 years or older, regardless of national origin, are candidates for preventive therapy only if they have one of the following conditions: (1) fibrosis on chest X-ray consistent with old, inactive TB; (2) recently acquired infection ( $\leq 24$  months); (3) HIV infection; or (4) other medical conditions associated with high-risk of TB reactivation. For more information:

*Core Curriculum on Tuberculosis: What the Clinician Should Know* (3rd ed). Atlanta: Centers for Disease Control, 1994.

American Thoracic Society, Centers for Disease Control: Treatment of tuberculosis and tuberculosis infection in adults and children. *Am J Resp Crit Care Med* 1994; 149:1359–1374.

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